## AMENDMENTS TO THE CLAIMS

1. (Canceled)

2. (Currently amended) A method for identifying the sequence of a portion of sample DNA comprising the sequential steps of:

(i) forming immobilized DNA comprising of one strand of sample DNA and one strand of primer DNA on ~~one~~ two or more reaction areas in a microchannel structure of a microfluidic device;

(ii) adding reagents including deoxynucleotide or deoxynucleotide analogue and DNA polymerase and moving said reagents within said microchannel structure to each of said one or more reaction areas so that extension of primer occurs as a result from complementarity of the added deoxynucleotide or deoxynucleotide analogue with the strand of sample DNA that is part of the immobilized double stranded DNA;

(iii) detecting whether or not the deoxynucleotide or deoxynucleotide analogue added in step (ii) is added to the primer DNA in said one or more reaction areas;

(iv) removing excess of said deoxynucleotide or deoxynucleotide analogue from said one or more reaction areas;

(v) repeating sequentially steps (ii) – (iv) with different deoxynucleotides or deoxynucleotide analogues ; and

(vi) identifying said sequence from the results of the above previous steps.

3. (Canceled)

4. (Currently amended) A method for identifying the sequence of a portion of sample DNA in a microfluidic device comprising a microchannel structure in

which there is a reaction chamber, wherein said method comprises the sequential steps of:

(i) adding sample DNA to the microfluidic device;

(ii) moving the sample DNA to the reaction chamber;

(iii) attaching the sample DNA to a surface of the reaction chamber, wherein a DNA primer is hybridized to the sample DNA in a single stranded form,

(iv) adding reagents including deoxynucleotide or deoxynucleotide analogue and DNA polymerase to said reaction chamber so that extension of primer DNA occurs as a result from complementarity of the added deoxynucleotide or deoxynucleotide analogue with the strand of sample DNA that is attached to the surface of the reaction chamber;

(v) detecting whether or not the deoxynucleotide or deoxynucleotide analogue added in step (iv) is added to the primer DNA in said reaction chamber;

(vi) removing excess of said deoxynucleotide or deoxynucletotide analogue from said reaction chamber;

(vii) repeating sequentially steps (iv) – (vi) with different deoxynucleotides or deoxynucleotide analogues; and

(viii) identifying said sequence from the results of the above previous steps.

5. (Canceled)

6. (Previously presented) The method of claim 2, wherein the deoxynucleotide or deoxynucleotide analogue that is added in step (ii) is labelled.

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Previously presented) The method of claim 2, wherein the microfluidic device is a disc and the fluids are moved by centripetal force within the microfluidic device.

13. (Canceled)

14. (Canceled)

15. (Canceled)

16. (Previously presented) The method of claim 4, wherein the microfluidic device is a disc and the fluids are moved by centripetal force within the microfluidic device.

17. (Canceled)

18. (Canceled)

19. (Currently amended) A method for identifying the sequence of a portion of sample DNA in a microfluidic device comprising a microchannel structure in which there is a reaction chamber, wherein said method comprises the sequential steps of:

i) attaching at least one primer DNA to each of between one and 100,000 reaction areas within the reaction chamber;

(ii) adding sample DNA to the microfluidic device;

(iii) moving the sample DNA to the reaction chamber;

(iv) hybridizing the sample DNA in single stranded form to the primer DNA;

(v) adding reagents including deoxynucleotide or deoxynucleotide analogue and DNA polymerase to the reaction chamber so that extension of primer DNA occurs as a result from complementarity of the added deoxynucleotide or deoxynucleotide analogue with the strand of sample DNA;

(vi) detecting whether or not the deoxynucleotide or deoxynucleotide analogue added in step (v) is added to the primer DNA in said reaction chamber;

(vii) removing excess of said deoxynucletoide or deoxynucletoide analogue from said reaction chamber;

(viii) repeating sequentially steps (v) – (vii) with different deoxynucleotides or deoxynucleotide analogues; and

(ix) identifying said sequence from the results of the above previous steps.

20. (Previously presented) The method of claim 2, wherein the detecting step (iii) measures the release of pyrophosphate.

21. (Previously presented) The method of claim 20, wherein the pyrophosphate release is detected by light emitted from a luciferin luciferase reaction.

22. (Previously presented) The method of claim 6, wherein the label is a fluorescent label.

23. (Previously presented) The method of claim 4, wherein the detecting step (v) measures the release of pyrophosphate.

24. (Previously presented) The method of claim 23, wherein the pyrophosphate release is detected by light emitted from a luciferin luciferase reaction.

25. (Previously presented) The method of claim 4, wherein the deoxynucleotide or deoxynucleotide analogue that is added in step (iv) is labelled.

26. (Previously presented) The method of claim 25, wherein the label is a fluorescent label.

27. (Previously presented) The method of claim 19, wherein the detecting step (vi) measures the release of pyrophosphate.

28. (Previously presented) The method of claim 27, wherein the pyrophosphate release is detected by light emitted from a luciferin luciferase reaction.

29. (Previously presented) The method of claim 19, wherein the deoxynucleotide or deoxynucleotide analogue that is added in step (v) is labelled.

30. (Previously presented) The method of claim 29, wherein the label is a fluorescent label.

31. (Previously presented) The method of claim 19, wherein the microfluidic device is a disc and the fluids are moved by centripetal force.

32. (Previously presented) The method of claim 2, wherein step (iv) is washing said one or more reaction areas to remove excess of said deoxynucleotide or deoxynucleotide analogue.

33. (Previously presented) The method of claim 4, wherein step (vi) is washing said reaction chamber to remove excess of said deoxynucleotide or deoxynucleotide analogue.

34. (Previously presented) The method of claim 19, wherein step (vii) is washing said reaction chamber to remove excess of said deoxynucleotide or deoxynucleotide analogue.

35. (Previously presented) The method of claim 2, wherein the amount of DNA sample is in the range of about 1 femtomole to about 200 pmol.

36. (Previously presented) The method of claim 35, wherein the amount of DNA sample is in the range of about 0.1 pmol to about 200 pmol.

37. (Previously presented) The method of claim 4, wherein the amount of DNA sample is in the range of about 1 femtomole to about 200 pmol.

38. (Previously presented) The method of claim 37, wherein the amount of DNA sample is in the range of about 0.1 pmol to about 200 pmol.

39. (Previously presented) The method of claim 19, wherein the amount of DNA sample is in the range of about 1 femtomole to about 200 pmol.

40. (Previously presented) The method of claim 39, wherein the amount of DNA sample is in the range of about 0.1 pmol to about 200 pmol.

41. (Currently amended) A method for identifying the sequence of a portion of sample DNA in a microfluidic device comprising microchannel structures with a common application area and a reaction chamber in each of said microchannel structures, wherein said method comprises the sequential steps of:

(i) forming immobilized DNA comprising one strand of sample DNA and one strand of primer DNA;

(ii) adding said immobilized DNA to said reaction chamber;

(iii) adding reagents including deoxynucleotide or deoxynucleotide analogue and DNA polymerase to said reaction chamber so that extension of primer occurs as a result from complementarity of the added deoxynucleotide or deoxynucleotide analogue with the strand of sample DNA that is part of the immobilized double stranded DNA;

(iv) detecting whether or not the deoxynucleotide or deoxynucleotide analogue added in step (iii) is added to the primer DNA in said reaction chamber;

(v) removing excess of said deoxynucleotide or deoxynucleotide analogue from said reaction chamber;

(vi) repeating sequentially steps (iii) – (v) with different deoxynucleotides or deoxynucleotide analogues; and

(vii) identifying said sequence from the results of the above previous steps.

42. (Previously presented) The method of claim 2, wherein said immobilized DNA is immobilized to a bead.

43. (Previously presented) The method of claim 41, wherein said immobilized DNA is immobilized to a bead.

44. (Previously presented) The method of claim 41, wherein said immobilized DNA is formed outside the microfluidic structure.

45. (Previously presented) The method of claim 41, wherein at least one of sample DNA and primer DNA is different for at least two reaction chambers within one and the same microfluidic device.

46. (Currently amended) A method for identifying the sequence of a portion of sample DNA in a microfluidic device comprising microchannel structures with a common application area and a reaction chamber in each of said microchannel structures, wherein said method comprises the sequential steps of:

i) attaching at least one primer DNA to each of between two and 100,000 reaction areas to the surface within the reaction chamber;

(ii) adding sample DNA to the microfluidic device;

(iii) moving the sample DNA to the reaction chamber;

(iv) hybridizing the sample DNA in single stranded form to the primer DNA;

(v) adding reagents including deoxynucleotide or deoxynucleotide analogue and DNA polymerase to the reaction chamber so that extension of primer DNA occurs as a result from complementarity of the added deoxynucleotide or deoxynucleotide analogue with the strand of sample DNA;

(vi) detecting whether or not the deoxynucleotide or deoxynucleotide analogue added in step (v) is added to the primer DNA in said reaction chamber;

(vii) removing excess of said deoxynucletoide or deoxynucletoide analogue from the reaction chamber;

(viii) repeating sequentially steps (v) – (vii) with different deoxynucleotides or deoxynucleotide analogues; and

(ix) identifying said sequence from the results of the above previous steps.

47. (Currently amended) A method for identifying the sequence of a portion of sample DNA comprising the sequential steps of:

(i) forming immobilized DNA comprising of one strand of sample DNA and one strand of primer DNA outside a microfluidic device which comprises a microchannel structure, and transferring said immobilized DNA to one or more reaction areas in a microchannel structure of the microfluidic device;

(ii) adding reagents including deoxynucleotide or deoxynucleotide analogue and DNA polymerase and moving said reagents within said microchannel structure to each of said one or more reaction areas so that extension of primer occurs as a result from complementarity of the added deoxynucleotide or deoxynucleotide analogue or dideoxynucleotide with the strand of sample DNA that is part of the immobilized double stranded DNA;

(iii) detecting whether or not the deoxynucleotide or deoxynucleotide analogue added in step (ii) is added to the primer DNA in said one or more reaction areas;

(iv) removing excess of said deoxynucleotide or deoxynucleotide analogue from one or more reaction areas;

(v) repeating sequentially steps (ii) – (iv) with different deoxynucleotides or deoxynucleotide analogues ; and

(vi) identifying said sequence from the results of the above previous steps.

48. (Previously presented) The method of claim 47, wherein the number of said reaction areas is two or more.

49. (Previously presented) The method of claim 48, wherein at least one of sample DNA and primer DNA is different for at least two reaction areas within one and the same microfluidic device.

50. (Previously presented) The method of claim 47, wherein said immobilized DNA is immobilized to a bead.

51. (Currently amended) A method for identifying the sequence of a portion of sample DNA comprising the sequential steps of:

(i) forming immobilized DNA comprising of one strand of sample DNA and one strand of primer DNA, and transferring said immobilized DNA to one or more reaction areas in a microchannel structure of a microfluidic device;

(ii) adding reagents including deoxynucleotide or deoxynucleotide analogue and DNA polymerase and moving said reagents within said microchannel structure to each of said one or more reaction areas so that extension of primer occurs as a result from complementarity of the added deoxynucleotide or deoxynucleotide analogue or dideoxynucleotide with the strand of sample DNA that is part of the immobilized double stranded DNA;

(iii) detecting whether or not the deoxynucleotide or deoxynucleotide analogue added in step (ii) is added to the primer DNA in said one or more reaction areas;

(iv) removing excess of said deoxynucleotide or deoxynucleotide analogue from one or more reaction areas;

(v) repeating sequentially steps (ii) – (iv) with different deoxynucleotides or deoxynucleotide analogues ; and

(vi) identifying said sequence from the results of the above previous steps

52. (Previously presented) The method of claim 51, wherein said immobilized DNA is immobilized to a bead.

53. (Previously presented) The method of claim 51, wherein said immobilized DNA is formed outside the microfluidic structure.

54. (Previously presented) The method of claim 51, wherein at least one of sample DNA and primer DNA is different for at least two reaction areas within one and the same microfluidic device.

55. (Currently amended) A method for identifying the sequence of a portion of sample DNA in a microfluidic device comprising microchannel structures with a common application area and a reaction chamber in each of said microchannel structures, wherein said method comprises the sequential steps of:

(i) adding sample DNA to the microfluidic device;

(ii) moving the sample DNA to the reaction chamber;

(iii) attaching the sample DNA to a surface of the reaction chamber, wherein a DNA primer is hybridized to the sample DNA in a single stranded form,

(iv) adding reagents including deoxynucleotide or deoxynucleotide analogue and DNA polymerase to said reaction chamber so that extension of primer DNA occurs as a result from complementarity of the added deoxynucleotide or deoxynucleotide analogue with the strand of sample DNA that is attached to the surface of the reaction chamber;

(v) detecting whether or not the deoxynucleotide or deoxynucleotide analogue added in step (iv) is added to the primer DNA in said reaction chamber;

(vi) removing excess of said deoxynucleotide or deoxynucleotide analogue from said reaction chamber;

(vii) repeating sequentially steps (iv) – (vi) with different deoxynucleotides or deoxynucleotide analogues; and

(viii) identifying said sequence from the results of the above previous steps.

56. (Currently amended) A method for identifying the sequence of a portion of sample DNA in a microfluidic device comprising microchannel structures with a common application area and a reaction chamber in each of said microchannel structures, wherein said method comprises the sequential steps of:

i) attaching at least one primer DNA to each of between one and 100,000 reaction areas within the reaction chamber;

(ii) adding sample DNA to the microfluidic device;

(iii) moving the sample DNA to the reaction chamber;

(iv) hybridizing the sample DNA in single stranded form to the primer DNA;

(v) adding reagents including deoxynucleotide or deoxynucleotide analogue and DNA polymerase to the reaction chamber so that extension of primer DNA occurs as a result from complementarity of the added deoxynucleotide or deoxynucleotide analogue with the strand of sample DNA;

(vi) detecting whether or not the deoxynucleotide or deoxynucleotide analogue added in step (v) is added to the primer DNA in said reaction chamber;

(vii) removing excess of said deoxynucletoide or deoxynucletoide analogue from the reaction chamber;

(viii) repeating sequentially steps (v) – (vii) with different deoxynucleotides or deoxynucleotide analogues; and

(ix) identifying said sequence from the results of the above previous steps.

58. (New) The method of claim 2, wherein the microchannel structure is associated with a common application area.

59. (New) The method of claim 58, wherein the common application area is annular.

60. (New) The method of claim 4, wherein the microchannel structure is associated with a common application area.

61. (New) The method of claim 60, wherein the common application area is annular.

62. (New) The method of claim 19, wherein the common application area is annular.

63. (New) The method of claim 41, wherein the common application area is annular.

64. (New) The method of claim 46, wherein the common application area is annular.

65. (New) The method of claim 47, wherein the microchannel structure is associated with a common application area.

66. (New) The method of claim 65, wherein the common application area is annular.

67. (New) The method of claim 51, wherein the microchannel structure is associated with a common application area.

68. (New) The method of claim 67, wherein the common application area is annular.

69. (New) The method of claim 47, wherein the detecting step (iii) measures the release of pyrophosphate.

70. (New) The method of claim 69, wherein the pyrophosphate release is detected by light emitted from a luciferin luciferase reaction.

71. (New) The method of claim 51, wherein the detecting step (iii) measures the release of pyrophosphate.

72. (New) The method of claim 71, wherein the pyrophosphate release is detected by light emitted from a luciferin luciferase reaction.

73. (New) The method of claim 51, wherein the number of said reaction areas is two or more